

Behavioral and Experimental Economics Do Inform Public Policy

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Behavioral and Experimental Economics Do Inform Public Policy

Arno Riedl*

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Experimental and behavioral economics are well-established branches of economic science. This essay presents and discusses some results and behavioral regularities from these fields, which are of potential and actual importance for public policy. After a brief introduction to what experimental and behavioral economics are, some important behavioral regularities – presentation and framing effects, prosocial behavior, and reciprocity – are introduced, and it is reported how they interact with prominent trading institutions, taxation, and social and individual well-being. Throughout, some implications for public policy are discussed.

Keywords: public economics, experimental economics, behavioral economics, public policy

JEL classification: C 90, D 00, H 00

After consulting my advisory board of experimental and behavioral economists, I am confident that the reframing proposed in the new public policy program will increase subjective well-being by 34 percent and prosocial orientation by 27 percent at almost no cost.

Taken from Amir et al. (2005) (rephrased by the author)

1. Introduction

Despite the largely unpredicted recent financial crises and accompanied economic downturn, most, if not all, recent public policy choices still rely on the traditional economic concept of rational economic man and woman, the

* This paper is based on my keynote lecture “Sociality and Institutions” presented at the workshop on Behavioral Public Economics at the Venice Summer Institute 2009 and on my inaugural lecture “Facts and Fiction in Public Policy: How Behavioral and Experimental Economics Can Inform Public Policy” at Maastricht University. I owe thanks to the participants in the Workshop on Behavioral Public Economics at the Venice Summer Institute 2009 and to the organizers of that workshop for their hospitality. I also thank an anonymous referee and the editor for their helpful and valuable comments on an earlier version of this paper, which was circulated under the title “Behavioral and Experimental Economics Can Inform Public Policy: Some Thoughts.”

homo economicus. Interesting examples in this respect are recent reforms in the Netherlands concerning the health insurance market and the markets for the supply of gas and electricity. In all cases important principles of the reforms were (i) more competition between suppliers, and (ii) more choice possibilities for consumers. The main arguments in favor of such reforms are based on the received wisdom among economists that increased competition and an enhanced choice set for consumers ultimately increase (consumer) welfare.

To a large extent the presumed positive outcomes rely on the assumption that consumers will exercise their power to choose. For the energy market reform in the Netherlands, however, the expectations about the exercise of consumer power have been largely disappointed, at least if one measures this power by the fraction of consumers switching supplier; for only a negligible fraction of consumers switched to an alternative electricity or gas provider. After the reform of the health insurance sector, though, consumers did seem to take up their power to choose. It was reported that with the introduction of the new health insurance system, in total 21 % of consumers have changed their insurance company (de Jong et al., 2008). However, even this switching behavior looks less impressive if one takes into account that a majority of those individuals who switched their insurance company did this within a so-called collective agreement where the employer (or another collective) and not the individual chose the insurance company. In all, only about 9% of all switchers decided to do so on an individual basis. Furthermore, in 2008 the percentage of people switching their health insurance provider decreased to a mere 4% (NIVEL, 2009).

However, any well-trained economist will argue that (non)switching behavior *per se* does not yet mean that consumers did not make the correct choices. Indeed, revealed-preference theory states that those who did not switch simply reveal that they had already chosen their utility-maximizing insurance package and/or energy supplier and hence had no reason to switch.

But let us be a little bit skeptical and ask if there is any way to assess if consumers indeed made good choices. Unfortunately, there is no study (at least that I am aware of) that investigates this question for the mentioned recent reforms in the Netherlands in a systematic way. Yet, an evaluation of a similar reform of the Swedish social security system in 2000 may help us to get some clues about how such reforms may work out and whether consumers indeed make the good choices traditional economic theory assumes. Cronqvist and Thaler (2004)¹ investigated consumer choice behavior after the introduction of the new system. In this system participants are allowed to choose their own portfolios, but there is also one default fund that is selected

¹ See also Thaler and Sunstein (2008, ch. 9).

automatically for those who do not actively choose. The authors asked if, compared to the default, active choices are better choices. They conclude that “it would be hard to make the case on an *ex ante* basis that the actively selected portfolios were better than the default fund” (Cronqvist and Thaler, 2004, p. 427).² In addition, in those first three years, and indeed up to 2007, the actively chosen funds also did worse in terms of returns (see Thaler and Sunstein, 2008, p. 427). Another interesting observation is that since the Swedish government reduced the campaigns advertising active choice, most people (90%) have opted for the default fund and almost nobody has made any changes to the chosen portfolio or switched the chosen fund.³

This study strongly suggests that consumers do not (always) make the wise choices traditional economic models assume. However, there are too many unobservables (e.g., risk preferences, self-selection effects) that may influence behavior, and one may well beware of drawing too strong conclusions from this field evidence. Therefore, in the remainder of this contribution I shall present “clean” evidence that standard assumptions of economic models are indeed often violated and argue that neglecting the observed nonstandard behavioral regularities will lead to wrong predictions and worse public policy than necessary.

The plan of the rest of paper is as follows. First, I shall briefly discuss the scope of experimental and behavioral economics. Then I shall present important examples of violations of standard behavioral assumptions, based on questionnaire studies and laboratory experiments. Thereafter, I shall link up these observations with questions concerning public economics and public policy. Finally, I shall present some ideas about interesting and important further research directions.

2. The Coherence of Experimental and Behavioral Economics

2.1. Experimental Economics

The principle of science, the definition almost, is the following: The test of all knowledge is experiment. Experiment is the sole judge of scientific “truth.”

Feynman (1964, chapter 1)

What precisely is experimental economics? As the name suggests, it is the branch of economics that uses experiments to investigate human behavior

- 2 In particular, in comparison with the default fund, actively chosen portfolios contained a higher equity exposure and much more local concentration (e.g., almost 50% of the equities are from Swedish firms), required more active management, and had higher fees.
- 3 When the system was introduced in 2000, two-thirds of participants actively selected a portfolio on their own. Interestingly, the proportion of people actively choosing their own portfolio decreased to 17.6% in 2001 and to only 8% in 2006.

in economic decision situations. Experimental economics is a method that brings real people to the laboratory (or the field), where they make real choices with which they earn (or lose) real money (Plott, 1982). An important feature of the method of economic experimentation, which distinguishes it from traditional empirical economic research, is that experiments allow the researcher to tightly control the environment in which people make choices. The controllable components of this environment comprise technologies, initial endowments, action spaces, timing of actions, accessible information, context, and – to some limited, but important, extent – also preferences. Varying these elements in a controlled way allows *ceteris paribus* inference and the isolation of true causes of change in human behavior to an extent unattainable by other methods of investigation. Additionally, laboratory experiments can be replicated by other researchers under the same or different conditions, thereby assessing the robustness of obtained results.

As economists, however, we know that there is no such thing as a free lunch. An often raised concern about the experimental method is the presumed lack of external validity of the obtained results. This is indeed a serious concern, in particular, when one aims at using the experimental method for informing public policy. I shall therefore come back to this issue at the end of the paper.

There are two hard and fast principles that experimental economists subscribe to and that also differentiate economic experiments from most experiments in psychology and marketing. Firstly, in economic experiments the monetary earnings subjects receive depend in a transparent way on the choices they make. The reason for the application of this principle is that it is one story to merely tell what one would do in a particular situation, but another story to actually take a particular action if it is linked with monetary consequences.⁴ Secondly, deception of subjects is effectively banned – the main reason being that once deception is used it is likely that the news of it will leak out. Subsequently the knowledge of being deceived will spread through the subject population, which seriously undermines an important advantage of experiments, namely having control over the information and knowledge subjects have concerning the economic situation they are in. For a discussion of the effects and costs of using deception in experimental research see, e.g., Ortmann and Hertwig (2002) and Jamison et al. (2008).

2.2. Behavioral Economics

But also needed is imagination to create from these hints the great generalizations to guess at the wonderful, simple, but very strange patterns beneath them

⁴ For evidence that monetary incentives indeed make a difference, see, e.g., Camerer and Hogarth (1999) and Forsythe et al. (1994).

all, and then to experiment to check again whether we have made the right guess.

Feynman (1964, chapter 1)

Behavioral economics is not a synonym for experimental economics, although they share some common ground. Initially behavioral economics strongly relied on empirical evidence generated in psychological and economic experiments. Nowadays, behavioral economics is defined more broadly as an approach incorporating evidence – not necessarily experimental – from psychology and other disciplines to explore the limits of existing models of behavior and create new, parsimonious ones that can explain actual behavior in a better way than current models are able to.

Importantly, behavioral economics does not abandon the disciplining strict formality that distinguishes traditional theoretical economic modeling from “softer” approaches in some other social sciences. It also does not try to fit a new model for each new behavioral anomaly or regularity, but rather seeks parsimonious models and themes that can be applied to many different domains. Behavioral economics is also not another subdiscipline, next to labor economics, public economics, and the like, but understands itself as a modeling approach that should be applicable to a wide range of economic questions, the ultimate aim being “generating theoretical insights, making better predictions..., and suggesting better policy” (Camerer and Loewenstein, 2004, p. 3). In particular, the last of these is also theme of this contribution.

3. Examples of Behavioral Regularities

3.1. Presentation and Framing Effects

Traditional economic reasoning is usually silent about possible effects of the presentation or framing of a decision situation. For instance, from the viewpoint of revealed-preference theory it simply does not matter whether one has to make choices in sequence or simultaneously. Rational economic man and woman will always choose according to their true preferences. These preferences are assumed to be well-behaved, coherent, and invariant with respect to superficial variations in the way a choice problem is presented. However, one might start to wonder then why grocery and other stores often price their products at 9.90, 19.99, and the like – just a little bit below a round number. Is this just coincidence – does it happen that the true marginal costs of all these products are exactly these prices? Probably not.

Let me pose the problem more concretely by discussing an example adopted from Simonson (1990), who was among the first to demonstrate with the help of an experiment that it may greatly matter whether consumers have

to choose from an array of products simultaneously or sequentially. Suppose one is entering a grocery store today and this store offers a choice one snack out of six different brands of snacks for free.⁵ The same will happen one week from today and two weeks from today. Hence, in each subsequent week one is free to choose the most preferred snack for free. Now, consider another grocery store that also offers free snacks for the next three weeks, again one per week. However, in this store the rule for choosing the free snack is slightly different. Here one has to choose today which brand of snack one would like to receive today, which one to receive in one week, and which one to receive in two weeks. Thus, the only difference is that in the second store one chooses today for today and the next two times, whereas in the first store one decides in each week on the spot.

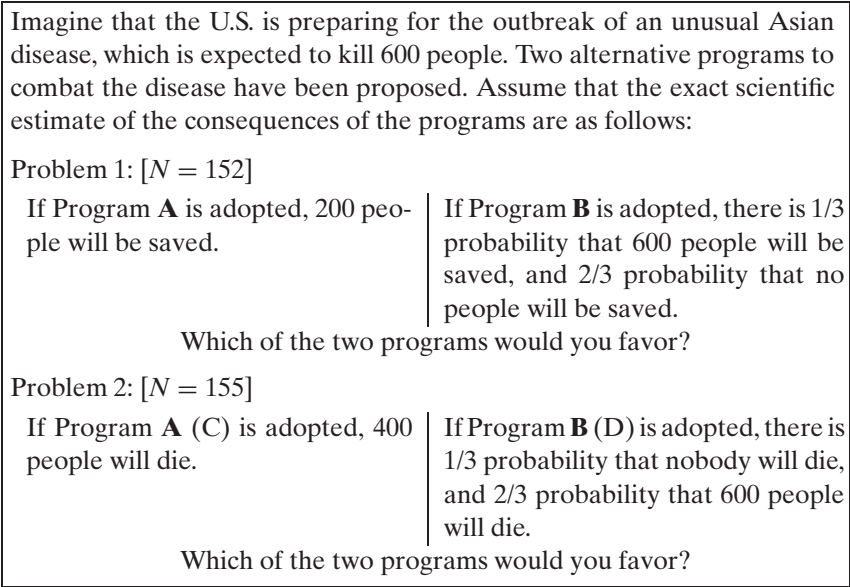
When facing such offers, for a homo economicus, doing the right thing is a pretty straightforward decision. Just choose the most preferred brand. Note that this does not mean that one is going to choose the same brand for each of the three weeks, because one might like variety in snacks. Importantly, however, whether the decision has to be made simultaneously or sequentially should not make a difference. Consequently, it should not matter if one is confronted with the choice sequentially three weeks in a row as in the first store, or if one has to choose at once for all three weeks as in the second store. One might not choose the same snack in each week, but the variety of snacks one chooses should not differ under the two conditions. Now, the question asked was whether real consumers act in this way. At least, students in a laboratory study (Simonson, 1990) did not do so. In the sequential choice (grocery store 1) only 9% chose a different snack in each week, whereas in the simultaneous choice for sequential consumption (grocery store 2), this was the case for 64% of participants. These are by no means small differences, and even a skeptic should be ready to admit that these results are hard to reconcile with the assumption of stable and/or coherent preferences. In a follow-up study Simonson and Winer (1992) corroborated the laboratory findings in the field by using scanner data on actual yogurt purchases in a grocery store. They found that the variety of flavors chosen significantly increases with the number of purchases per occasion. The observed choices in the laboratory and the store strongly indicate that revealed preferences systematically depend on the way the choice set is presented, a dependence not accounted for in traditional economic models.⁶

5 If one does not like snacks at all, one can imagine brands of other products, e.g., beer or yogurt.

6 These observations are consistent with the concept of *choice bracketing* and its specific consequence of *taste change* (Read et al., 1999). The former refers to the fact that the way people make decisions, narrowly or broadly, affects their choices. The latter refers, specifically, to the effect that the choice people make today can change their tastes and, hence,

A second prominent example, which probably casts even more doubt on the assumption of coherent and stable preferences, is the famous study, known as the *Asian disease* problem, by Tversky and Kahneman (1981). Tversky and Kahneman conducted questionnaire studies with students (at Stanford University and the University of British Columbia) where they asked them to indicate their preference concerning different programs proposed to combat an unusual Asian disease. To study potential framing and presentation effects, the problem was presented in two economically equivalent but presentationally different formulations. Figure 1 reproduces the original text.

Figure 1
The Asian Disease Problem of Tversky and Kahneman (1981)



Problem 1 presents the decision situation in a *positive* frame by emphasizing that lives can be *saved*. Problem 2, in contrast, presents the very same options in a *negative* frame by emphasizing that some people will have to *die*. Obviously, Programs A in Problems 1 and 2 are identical, since in both cases 200 people will be saved and 400 people will die for sure. The same is true

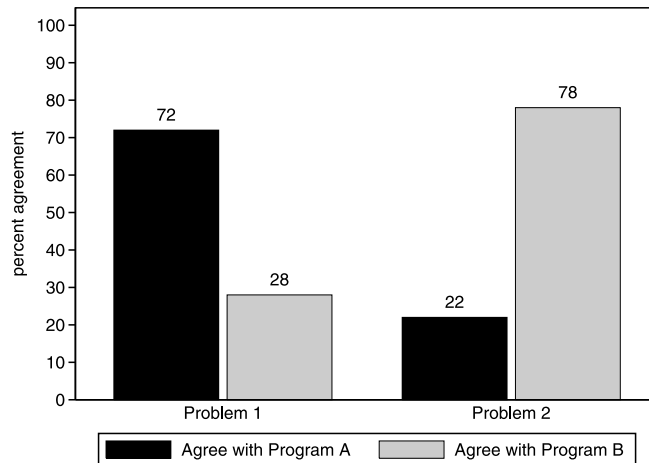
influence their choices in the future. The emergent property of *diversification bias* seems to be a robust phenomenon and is replicated in several studies (see Read et al., 1999, p. 178).

for Programs B, where in both problems 200 people will be saved and 400 people will have to die, in expectations. Hence, whatever people like more, there should be no significant difference in revealed preferences between the two problems.

Figure 2 depicts the frequency of actual choices. When the subjects are confronted with Problem 1 (positive frame), an overwhelming majority of 72% opt for program A, which saves 200 people for sure, whereas only 28% opt for the risky program where 200 people are saved only in expectations. When they are confronted with Problem 2, a dramatic shift in revealed preferences occurs. Now, only a minority of 22% go for the sure outcome of 400 dead people, but 78% are ready to accept the risky choice where 400 people die only in expectations. It should be obvious that such a strong framing effect, effectively inducing revealed-preference reversal, is hard to square with the assumption of coherent and stable preferences.

Figure 2

Actual Choices in Asian Disease Problems (Tversky and Kahneman, 1981)



The offered options in Tversky and Kahneman's study are both rather undesirable, in the sense that one has to choose between sacrificing more people and sacrificing less people. Unfortunately, this makes them representative of many decisions made in the public domain. Consider, for instance, public investment decisions, especially, investment in infrastructure concerning safety. The decision not to invest in more secure highways or railway infrastructure means to effectively decide to accept deaths that otherwise could have been avoided. Similarly, not investing in research for an influenza vaccine means

risking avoidable deaths in case of an outbreak of influenza. Many more examples could be given, from airport security to school crossing guards (“lollipop men”).⁷

...in situations where self-interest and ethical values with wide verbal allegiance are in conflict. Much of the time, most of the time in fact, the self-interest theory...will win.

Stigler (1980, p. 176)

3.2. Morality and Reciprocity

Although the neoclassical concept of utility is broad and flexible (critics might even say tautological and hence without content) and, therefore, in principle not restricted to narrow selfish preference orderings, most work and almost all applications in (public) economics assume that people are narrow-minded selfish material-wealth maximizers. One might argue that, as long as models based on the assumption of narrow self-interest describe behavior of real people sufficiently well and, hence, make correct predictions that can be used to evaluate and validate public policy, there seems to be no reason to abandon such models. This is precisely the argument endorsed by Milton Friedman, who argues that theories should be judged by the accuracy of their predictions but not by the accuracy of their assumptions Camerer (2005). However, if not only the basic assumptions are counterintuitive (and empirically proven to be wrong) but also the models’ predictions are incorrect or at least misleading, then this approach is in deep trouble.

In the following I shall describe two prominent simple games where models based on narrow material self-interest turned out to do a bad job in predicting actual behavior. These examples will show that fairness considerations and, in particular, an inclination towards reciprocal behavior are important constituents of human behavior. I shall distinguish between *negative reciprocity* and *positive reciprocity*. Negative reciprocity describes the tendency to respond to an unkind act with an unkind act, whereas positive reciprocity describes a kind response to a kind course of action.⁸ The following examples will make these differences clear.

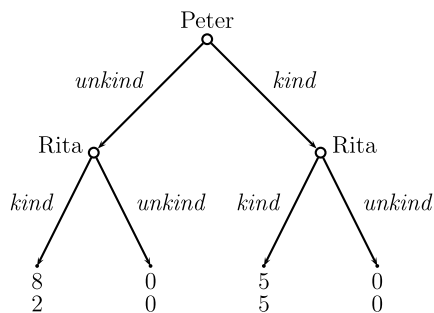
7 A nice and rather harmless example where the management of a semipublic enterprise seems to take framing effects into account is the following: recently the Dutch railways have stopped using the word “delay” when announcing that a train will arrive late at the railway station. Instead, it is announced that “the train will arrive in a few minutes.”

8 In a sense positive and negative reciprocity may be viewed as just two sides of the same medal, since a non-unkind act is obviously a kind act. However, different emotions may be involved (e.g., anger versus joy) with negative and positive reciprocity, which is likely to make the responses psychologically and physiologically different. Additionally, reference points of fairness are important for the judgment of kind and unkind behavior.

3.3. Negative Reciprocity – the (Mini) Ultimatum Game

The ultimatum game by Güth et al. (1982) can be interpreted as a negotiation or bargaining situation that is stripped down to its most important constituents. It is a situation involving two people where one individual can make a take-it-or-leave-it offer to the other individual, who can, indeed, take it or leave it.⁹ Figure 3 depicts – for the sake of the argument – an even further boiled-down version of the originally investigated ultimatum game (adapted from Falk et al., 2003). There one player, say Peter, has received 10 euros, which he has to split between himself and, say Rita, in a take-it-or-leave-it way. If Rita accepts the offer, both receive money according to the proposal. If she rejects it, then neither Peter nor Rita receives any money. For simplicity, Peter is given only two possible ways to split the money. He can make a rather unkind offer, “I take 8 and you get 2,” leaving most of the money for himself, or he can decide to be kind and propose to split the money evenly, “I take 5 and you get 5,” Rita, faced with one of these offers, has to decide whether to accept the offer or to turn it down. Traditional economics assuming narrow selfishness tells us that, because more money is better than less money, Rita will accept any offer. In terms of the figure it means that Rita will be kind after a kind proposal (5,5) and will also be kind after an unkind proposal (8,2).

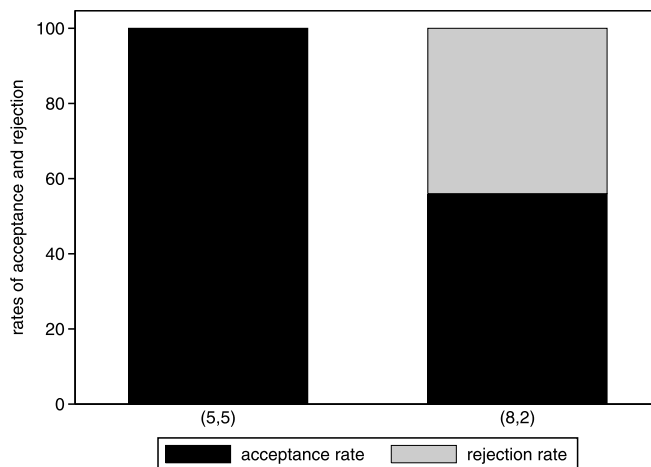
Figure 3
The Mini Ultimatum Game



The empirical facts, however, deviate significantly from this prediction. A typical (qualitatively and quantitatively representative) result generated in many experiments is shown in Figure 4. It shows the percentage of ac-

⁹ Note that such (or similar) situations are not uncommon in everyday life. For instance, it is akin to shopping in Western supermarkets or shops, where one is usually not negotiating the price of the product but rather takes it or leaves it (on the shelves).

Figure 4
Acceptance and Rejection Rates in Mini Ultimatum Game



Data source: Falk et al. (2003)

cepted and rejected offers for both possible proposals. As one would expect, the kind proposal of (5,5) is never followed by the unkind response of a rejection. The situation looks quite different, however, if an unkind proposal of (8,2) is put on the table. Such a proposal is often followed by an unkind response, namely rejection. In the reported experiment this happens in more than 40% of the cases. It is important to see that the unkind response is costly, leaving both players without any monetary gain. This is precisely what makes it incompatible with traditional economic reasoning assuming narrow selfishness.¹⁰

3.4. Positive Reciprocity – the Gift-Exchange Game

Probably the best-known example of the existence of a predisposition towards positive reciprocity stems from a game termed the gift-exchange game.¹¹ In economics, the basic idea behind this game dates back (at least) to Akerlof (1982), who argued that gift exchange is an important constituent

¹⁰ Actually, the rejection rates for offers of only about 20% of the whole pie are usually higher than the 40% reported here. A likely reason is that Falk et al. (2003) applied the so-called strategy method, where subjects have to decide upon acceptance and rejection before they know the actual choice. That is, they make their decision in a cold (emotional) state, whereas responses to actual offers are made in hot (emotional) states (see Loewenstein, 1999).

¹¹ A game very similar in nature is the so-called trust game (Berg et al., 1995).

of labor contracts that are genuinely incomplete. The *incompleteness* of the contract refers to the fact that the effort exerted by an employee is often not verifiable, because it cannot be observed by the employer and/or cannot be enforced by a third party. Akerlof's theoretical model, however, relied on assumptions about economic behavior of employees that are at odds with the assumption of narrow selfishness – namely, that employees respond to higher wages positively, in the sense that higher wages make them exert higher and more costly effort.

In Fehr et al. (1993)¹² this idea is put to a test in the experimental laboratory. In fact, the implemented situation more generally represents any kind of patron–client or principal–agent relationship where contracts cannot be (perfectly) enforced. More concretely, consider the following situation (based on Riedl and Tyran, 2005): A number of people are divided into a set of *employers* (“buyers”) and a (larger) set of *employees* (“sellers”). The rules of the game are as follows. If an employer hires an employee who provides effort e and receives a wage w , then the employer's earnings π are $30 + 10e - w$. That is, the employer earns a lump sum of 30 plus 10 times the effort e exerted by the employee minus the wage w paid. The wage is between 1 and 100 ($1 \leq w \leq 100$), and the effort between 1 and 10 ($1 \leq e \leq 10$). The earnings u of the employee are then the wage w he receives minus a *cost of effort* $c(e) = e$ plus a lump-sum payment of 4 ($u = w - e + 4$). The sequence of actions is as follows. The employer first offers a *contract* specifying a wage w . When the contract is signed, the employee receives the wage *before* exerting any effort. Only after the wage is paid out does the employee decide on his effort, and he is completely free to choose any level of effort. Importantly, each employer–employee interaction is anonymous and essentially one-shot. That is, there is no possibility for reputation building or retaliation.

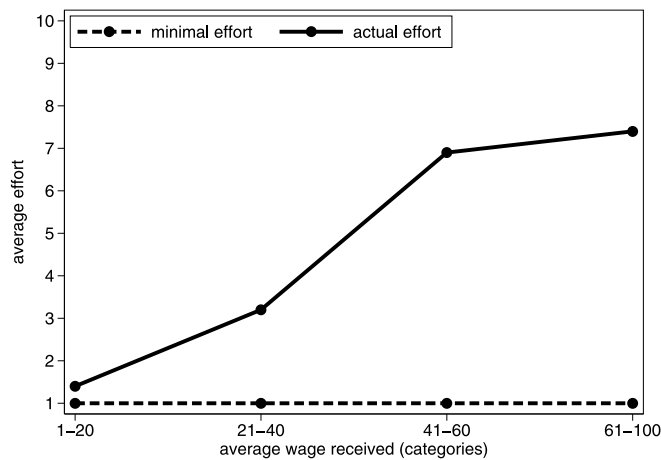
What will be the outcome of such an interaction? Consider first the employee who has received a wage and has now to decide on the effort level. Under the assumption of narrow selfishness, any employee will choose the effort level with the lowest cost, $e = 1$, no matter how high or low the wage received is. In effect, choosing a higher effort level only decreases his total earnings. A rational and selfish employer will perfectly anticipate this behavior and hence offer the lowest acceptable wage, $w = 5$, which is still accepted.¹³

However, in the experiment this predicted outcome is very rarely observed. Moreover, gift exchange is observed as a very strong behavioral regularity. Figure 5 illustrates this. The figure plots, on the vertical axis, the (average) effort chosen by the employees against the average wage offered

¹² See also Fehr et al. (1997, 1998).

¹³ An employee without a contract receives a payment of 4.

Figure 5
Gift Exchange in an Experimental Labor Market



Source: Riedl and Tyran (2005)

by the employers on the horizontal axis. Under the assumption of narrow self-interest, employees should always choose the lowest, implying no positive (or negative) relationship between effort and wages. This is reflected by the straight line running through $e = 1$. The actual data, however, show a strikingly different pattern: effort is clearly and strongly increasing in the wage received. In the figure this is reflected by the increasing line, which connects average effort levels for wages smaller than 20, between 21 and 40, between 41 and 60, and larger than 61. Hence, in conclusion, this and many other studies (for a recent review see Fehr et al., 2009) clearly show that people respond positively reciprocally. An important side effect of the observed gift exchange is that it increases efficiency (in terms of surplus maximization) and decreases inequality in earnings, in comparison with the benchmark outcome predicted under traditional behavioral assumptions.

4. Behavioral Regularities, Public Economics, and Public Policy

One might wonder what all of this has to do with public economics and public policy. In the following I shall argue that the described behavioral regularities can indeed be of eminent importance for public economics and policy.

4.1. On the Interaction between Trading Institutions, Morality, and Tax Shifting

An interesting and important example where economic institutions and inclinations toward reciprocity interact in a nontrivial way is the case of *tax liability side equivalence*. Tax liability side equivalence is a basic tenet in public economics. It states that the statutory incidence (that is, who is legally responsible to pay a tax) is irrelevant to the economic incidence (that is, who actually bears the tax burden). In the words of one of the authorities in public economics, Richard A. Musgrave,

it is a matter of indifference whether a general tax on transactions is assessed on the seller's or on the buyer's side of the market.

Musgrave (1959, p. 351)

Importantly, under traditional economic assumptions this holds true independently of the trading environment (monopoly, oligopoly, competition, or bargaining), provided that prices can in principle adjust freely. Interestingly enough, however, much of the public debate about tax burden (and subsidy benefit) in the media and the political arena is concerned with statutory instead of economic incidence. This raises the question whether the public reasoning or the professional economic reasoning is incorrect. For public policy the answer to this question is obviously important, because it determines which groups of the society are actually going to carry the burden of a tax, and hence what the distributional and allocational consequences of the tax are. Neglecting the behaviorally true tax burden and relying (only) on normative prescriptions that are based on incorrect behavioral assumptions may, therefore, have very undesirable political and economical consequences.

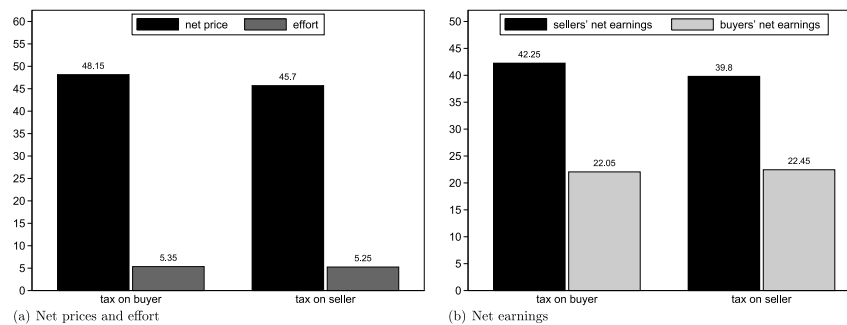
To uncover the behaviorally true tax burden, ideally one would like to shift the statutory tax burden from one side of the market (e.g., buyers) to the other side of the market (e.g., sellers), *leaving everything else equal*. Naturally, such situations do not occur regularly in the field. Fortunately, laboratory experiments are an ideal method to do precisely this. The following briefly reports on three sets of experiments testing tax liability side equivalence under three important economic institutions: competitive markets with complete contracts, bargaining, and gift-exchange markets.

Three studies (Borck et al., 2002; Kachelmeier et al., 1994; Ruffle, 2005) experimentally investigate tax (and subsidy) incidence equivalence in competitive markets under various trading mechanisms. The results of these experiments can be summarized simply: tax liability side equivalence holds in competitive experimental markets independently of the trading institution. Traditional theoretical and behavioral tax incidence coincide. Kerschbamer and Kirchsteiger (2000) give an interesting twist to these results by study-

ing tax liability side equivalence in a simple bargaining environment. They modify the ultimatum game (similar to the one described above) so that in case of acceptance of a proposal one of the negotiators has to pay a tax from her gross earnings. In one treatment the proposer has to pay the tax. In a second treatment the statutory tax burden is placed upon the responder. If tax liability side equivalence holds, the distribution of earnings should be the same under both tax treatments. However, if statutory tax incidence implies also a moral obligation to actually bear part of the tax burden, then tax liability side equivalence breaks down. It is well known that in bargaining situations reciprocity and distributional fairness crucially influence behavior and economic outcomes. Hence, one might expect that tax liability side equivalence is especially vulnerable in such situations. Indeed, Kerschbamer and Kirchsteiger (2000) find that the side of the transaction that is legally obliged to pay the tax also bears a disproportionate part of the economic tax burden. The observed incompleteness of tax shifting is also economically significant. When the tax liability was taken from the responder and placed upon the proposer, the offered net (after tax) income for responders *increased* by up to 24%. In contrast, standard tax liability side equivalence predicts no change in net income at all. Therefore, this is a clear case where trading institution and moral behavior interact in a way traditional theory fails to predict.

Perfectly competitive markets and pure (two person) bargaining situations are at the two extremes of actually existing economic exchange institutions. Although both are fairly common, they are probably not the most frequent trading institutions. Rather, a mixture of the two seems to be the most common one. Gift-exchange markets or markets with incomplete (or even no) contracts, as described above, incorporate both elements: competitive market interaction and bilateral bargaining. Riedl and Tyran (2005) investigate tax liability side equivalence in such markets. In one set of experiments buyers are legally obliged to pay a tax, and in another set of experiments sellers bear this obligation. If tax liability side equivalence holds, then there should be no difference in the outcomes of real variables between the two tax regimes. However, if moral obligations, as in the study of Kerschbamer and Kirchsteiger (2000), are important, then the side on which the tax is levied should also bear a larger part of the economic burden of the tax. In gift-exchange markets three important variables can be investigated: net prices, effort, and net earnings. Tax liability side equivalence may fail on each of these dimensions, with different consequences for the final distribution of income. Figure 6 depicts average net prices and exerted efforts in panel (a) and average net earnings in panel (b) for both regimes; taxes levied on buyers and taxes levied on sellers. From the figure it is obvious that there are no large differences between the two tax regimes on any of the three dimen-

Figure 6
Prices, Effort, and Earnings under the Two Tax Regimes



Source: Riedl and Tyran (2005)

sions of comparison. Furthermore, the observed small differences are neither statistically nor economically significant. This is an important but also somehow puzzling result, given the observation that tax liability side equivalence breaks down in pure bargaining and not when it is coupled with a competitive market. It strongly suggests that the details of market interaction and perceptions about moral obligations to pay a tax interact in a nontrivial way, with real and economically significant results in terms of tax shifting.

One conclusion to be drawn from these studies is that researchers as well as policymakers should not solely rely on traditional economic theorizing when assessing the economic burden of a tax. Additionally, the institutional environment and its interaction with moral and reciprocal inclinations crucially affect the actual economic outcome. Where the precise borders for predictive accuracy of the standard economic model lie is still an open empirical question, though. If we want to understand under which circumstances tenets like tax liability side equivalence indeed hold or – more importantly – have to be modified, we need a research program that systematically evaluates such pieces of economic wisdom.

4.2. Identifiable Victims and Hidden Taxes

Real outcomes can be nontrivially influenced not only by the interaction between institutional design of trading institutions and behavior of economic agents, but also through pure presentation effects. In a 1968 article Thomas Schelling noticed that “[t]he life you save may be your own” and that “the death of a particular person evokes anxiety and sentiment, guilt and awe,...[but that]...most of this awesomeness disappears when we deal

with statistical death” (Schelling, 1968). This is probably the first account by an economist pointing towards how differently we perceive identifiable and statistical victims. Loewenstein et al. (2006) take up this issue and examine the public policy consequences of this human inclination to have stronger feelings towards an identifiable victim than towards a statistical victim. They argue that from a welfare economics point of view “people may be insufficiently sympathetic towards statistical victims.” Mainly psychological research strongly supports the claim that individual concrete cases have a much more powerful motivational effect than statistical cases. This seems to be true even if the statistics are objectively more informative than the individual case. A typical example in this respect is that opinions about the abuse of welfare payments are shaped much more strongly by individual experience than by objective statistics.¹⁴

An important public policy implication of the identifiability effect is that for politicians hidden taxes tend to be much more popular than other taxes. For example, the value added (or sales) tax is for most consumers (including economists) simply part of the purchase price of a commodity, and hence has no identifiable victim. This concealment may make it politically easier to raise value added taxes than more direct taxes. How serious and economically important the misperception of hidden taxes is, is convincingly shown by Chetty et al. (2009). These authors conduct a field experiment in a grocery store where in one treatment the sales tax is made salient by explicitly showing it on the price tag whereas in another treatment only the tax-inclusive price is shown. The study finds a significant 8% decrease in purchases and sales revenues when the tax is made salient. This salience effect is corroborated with field empirical data using variations in taxes on beer among U.S. states. An important conclusion of this study is that it is crucial to distinguish between tax elasticities and price elasticities when thinking about tax policy – a distinction not necessary in traditional public economics.

Other prominent examples of hidden taxes are withholding income taxes, which make people think that the money transferred to the tax authority is not their own, and corporate income taxes, which make people think that shareholders pay the tax, although it is mostly the factor labor that actually carries the tax burden (McCaffery, 1994; McCaffery and Baron, 2006). In the mentioned examples the lack of identifiability makes the taxes themselves as well as an eventual increase of them much more acceptable than it would be the case for nonhidden taxes.¹⁵

¹⁴ For clean evidence from the laboratory (dictator game giving) as well as the field (housing for the needy), see Small and Loewenstein (2003).

¹⁵ The psychological appeal of hidden taxes is nicely summed up by the aphorism of Russell Long, one of the most powerful and influential tax legislators as chairman of the U.S.

Experimental and behavioral research has uncovered a number of other behavioral regularities that are particularly important for taxation economics, like misperception of the progressivity of the tax system, confusion of marginal and average income tax rates, and nonrationally high tax compliance rates (see, e.g., de Bartolome, 1995; Liebman and Zeckhauser, 2004; Slemrod, 2006). In his contribution to this issue Slemrod (2010) discusses some of these problems in more detail.¹⁶

4.3. Endogenous Preferences and Competition

One central assumption in economics is that people have “fixed lifetime preferences” (Bernheim and Rangel, 2007). In particular, this means preferences are assumed not to change across states of nature or institutional constraints. In this perspective, preferences are exogenously fixed and independent from the environment an individual is immersed in. In contrast to this traditional view, Bowles (1998) argues vividly in favor of *endogenous* preferences. He claims that our preferences are not well defined and stable, but rather are strongly dependent on the environment we have to deal with. However, all the evidence he puts forward in support of his claims is either indirect or open to alternative interpretations.

In a recent study, Brandts et al. (2008, 2009) experimentally test the direct influence of trading institutions on subjective well-being and (social) preferences. In a series of experiments subjects are divided into two groups. One group interacts in a competition-free environment, whereas subjects in the other group interact in a competitive environment. The hypothesis is that the experience of competition versus no competition *per se* leaves its traces in subjects’ well-being (in the sense of Kahneman et al. (1997)’s “experienced utility”) and in their social preferences (that is, their “social disposition towards others”). To test this hypothesis, methods from social psychology are combined with experimental economics. At the beginning of the experiment subjects are asked to perform a social value orientation test, which measures subjects’ social preferences by letting them allocate real money between themselves and some anonymous other person. The same test is conducted also after subjects have experienced a competitive or a noncompetitive environment. Hence, social preferences are measured before and after the experience with a particular trading institution. If traditional economic reasoning were correct, then for the social orientation of participants it should not matter whether they have experienced a competitive or a noncompetitive

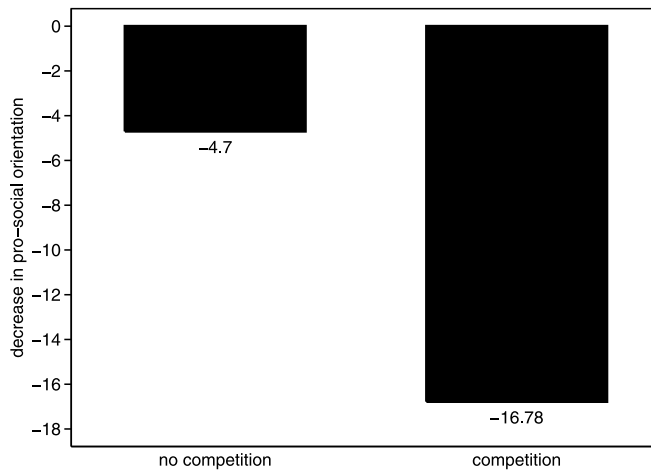
Senate Finance Committee: “Don’t tax him, don’t tax me, tax the man behind the tree” (quoted after Small and Loewenstein, 2003).

¹⁶ For earlier accounts of taxation and behavioral economics, see McCaffery and Slemrod (2006) and Kirchler (2007).

environment. This is not what is found. Firstly, there is a difference in the social orientation of subjects experiencing different institutions, and secondly, within the competitive institution the social orientation differs strongly between subjects who have experienced it in different roles (i.e., being on the long or the short side of the trade relationship).

Figure 7

Change in Social Preferences in Competitive and Noncompetitive Environment



Source: Brandts et al. (2009, 2008)

Figure 7 gives a visual impression of the differences in social preferences. It shows the change in social orientations from before to after the experience with the competitive and the noncompetitive environment, respectively.¹⁷ Interestingly, under both trading regimes prosocial orientation deteriorates. Importantly, however, compared to experience with the no-competition regime, the decrease in prosocial orientation is more than three times larger when subjects experience competition. This clearly indicates that preferences are indeed not – or at least only partly – exogenously given and are strongly shaped by subjects' institutional experience. An additional result of this study is that it is not only social orientation that deteriorates under competition, but that subjects also suffer a loss of experienced utility (i.e., subjective well-being). Similar findings are reported in a meta-study

¹⁷ For clarity of presentation, only the average of the strongest change in social preferences among subgroups across all investigated competitive environments is shown.

by Bowles and Polania Reyes (2009). The authors survey the data of 51 experiments and find that explicit economic incentives aimed at the narrowly materially selfish individual often have not only the intended effect of providing information and suggesting socially appropriate behavior, but also the unintended and unwanted effect of compromising intrinsic motivation and self-determination. An important conclusion drawn from reviewing these studies is that economic incentives and social preferences seem more often complements than substitutes.

In public and political debates, reforms aiming at more competition are often backed with the received wisdom of traditional economics that consumers will be better off in the presence of more competition. This argument refers to the notion of consumer surplus, which (in practice) measures welfare in purely material terms. This surplus may indeed increase with more competition and less regulation (although in the experiment discussed above even this is not the case). However, the ultimate aim of welfare economics and public policy should be the maximization of the citizens' well-being. Therefore, the findings of deteriorating social orientations and declining subjective well-being call into question the supposedly purely positive effects of more competition and less regulation. Unfortunately, there is as yet no generally accepted measure of subjective well-being developed, and much more research into the measurement and determinants of well-being is necessary.¹⁸

The evidence reported above also points to the important and not yet well understood interplay between heterogeneous social preferences and institution design and formation. There is mounting evidence that people differ quite substantially with respect to their social preferences (e.g., Andreoni and Miller, 2002; Engelmann and Strobel, 2004; Fisman et al., 2007; Bellemare et al., 2008), and there is also recent evidence that even subtle institutional differences may alter behavior substantially (see, e.g., Falk and Kosfeld, 2006; Reuben and Riedl, 2009). However, evidence on how these interact is only very recently emerging (Kosfeld et al., 2009).

4.4. Presentation Effects and Public Policy

Finally, to close the circle, let me give two examples where research into presentation and framing effects can very concretely inform public policy and thereby increase general well-being. The first one is taken from Amir et al. (2005) and highlights the importance of whether a decision task is presented simultaneously or sequentially. In many places police lineups are used to identify suspects of crime. In such a lineup eyewitnesses of crimes

¹⁸ Recently, some progress is reported concerning the measurement of subjective well-being. Kahneman and Krueger (2006) introduce a measure based on self-reports of people's emotional states (see also Brandts et al., 2008).

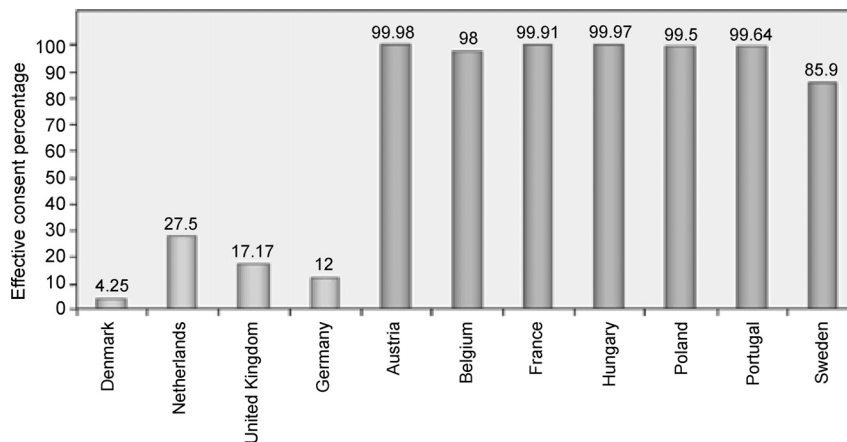
attempt to recognize one person in a group of suspects standing next to each other.

Evidence from psychological research casts serious doubts on this much-used method of identification. Lindsay and Wells (1985) designed a clever experiment and showed that the likelihood of false identification of an innocent subject is much higher under simultaneous than under sequential lineup. At the same time the frequencies of correct recognition of the guilty suspect did not differ significantly between the two conditions. This, together with subsequent research, clearly shows that in identification tasks – such as police lineups – the practice of presenting items or individuals one at a time leads to better (less biased) judgments than the practice of presenting them simultaneously. The straightforward and unambiguous policy recommendation is, therefore, to abandon simultaneous lineups in favor of sequential lineups. Actually, at least two U.S. states have adopted that alternative method.

The organization of organ donation is another important domain where it has been shown that framing effects can crucially alter behavior and, in this case, make the difference between life and death. Johnson and Goldstein (2003) investigate and compare two different organ donation systems around the world. They distinguish between two so-called no-action defaults. No-action defaults are the choices implicitly imposed on individuals who do not take an active decision. In the case of organ donation the most widely used default decisions are *presumed consent* and *explicit consent*. Presumed consent means that people are assumed to be organ donors as long as they do not actively indicate otherwise. Explicit consent means that individuals have to actively register for being a donor; otherwise they are not. The authors investigate the effective consent rates for being a donor across the two defaults, experimentally as well as by cross-country comparisons. Traditional economic theory assumes that preferences are fixed and known to the economic agent, which implies that for effective consent rates it should not matter whether one or the other default option is taken. Figure 8 shows the facts. The four leftmost bars depict effective consent rates for four countries (Denmark, the Netherlands, the UK, and Germany) that apply explicit consent as the default. The bars to the right show effective consent rates for countries with presumed consent as default. The differences are striking. Whereas in the explicit-consent countries the effective consent rates are maximally 27.5% (the Netherlands), the minimum consent rate in countries with presumed consent is 85.9% (Sweden). These differences are surely too large to be explained by effort or transaction costs of actively opting in and opting out in the explicit-consent and presumed-consent countries, respectively. To exclude definitively this potential explanation, the authors conducted an experiment where effort and transaction costs were virtually zero. In the experiment the difference in effective consent rates between the two default

Figure 8

Effective Consent Rates in Countries with Explicit Consent (Four Leftmost Bars) and Presumed Consent (Seven Rightmost Bars)



Source: Science 302, 1338 (2006)

options is slightly smaller than in the cross-country study, but still a long way from zero. Interestingly, a neutral framing without any default led to the same effective consent rate as the presumed-consent default. This allows the conclusion that the unbiased “true” preferences concerning organ donation are better elicited with presumed consent than with explicit consent. That some policymakers are – at least sometimes – aware of the fact that default options make a difference is nicely reflected in arguments brought forward during a recent discussion about reforming the donor registration system in the Netherlands. In 2005 a coalition of parties in the parliament actually did bring forward a motion that would have changed the explicit consent default into a presumed consent default. In the end, however, there was not enough political support for such a radical change of the donor registration system.¹⁹ In any event, this example highlights how insights from behavioral and experimental research are related to important political decisions and

¹⁹ A clear case of a presentation and framing effect is also reported in an article in the Dutch newspaper *NRC Handelsblad* (September 2 & 3, 2006, pp. 41–42) about the Dutch immigration and naturalization service (IND). The newspaper reports that if employees of the IND *reject* an application for a temporary residence permit, they have to explain their decision in writing. For the case of hardship of asylum seekers, the IND employees have to explain the decision if they *accept* the application. The result is that cases of hardship are hardly ever positively assessed, whereas temporary residence permits are relatively easily issued.

can inform public policy more accurately than traditional economic reasoning would be able to.

5. Further Directions: the Field and the Brain

A common argument of skeptics against the use of laboratory experiments in general, and as a policy advice instrument in particular, is their supposed lack of external validity. This is indeed an important concern, because if regularities observed in the laboratory do not carry over to the field, any conclusions and public policy advice drawn from these experiments could be dangerously misleading. The potential problem of lack of external validity is not unique to economic (or psychological) experiments, however.²⁰ In physics, the feather and the stone, which fall with the same speed in vacuum but with different speeds in “real life,” constitute a well-known illustrative example. As the air resistance in the terrestrial atmosphere affects the fall velocity of the two objects, in economic situations many factors one can control for in the laboratory but not in the real world can influence behavior and blur or even wipe out behavioral regularities observed in the laboratory. The experimental method offers a unique way to tackle this problem, which is adding pieces of real-life context to the dry laboratory environment *in a systematic way*. In this way one can trace if and how such pieces of reality alter behavior.²¹

Another important way to check for external validity is to replace the usual student subjects with subjects who are experienced with the decision situation at hand and/or are more representative than students. Such experiments have been conducted for a variety of decision situations (see, e.g., Fehr and List, 2004; Egas and Riedl, 2008, among many others). The general upshot from these experiments is that experts often do not make significantly different decisions from students in the same situation, although there are sometimes subtle and surprising differences. For instance, Alevy et al. (2007) investigate the behavior of financial market professionals regarding information cascades and find that “professionals are less Bayesian than students” (ibid., p. 161), but report only little evidence for differences in cascade formation. Haigh and List (2005) investigate the difference in myopic loss aversion (MLA) between students and professional traders and find that “traders exhibit behavior consistent with MLA to a *greater* extent than students” (ibid.,

²⁰ Note that theoretical reasoning is confronted with exactly the same potential lack of external validity.

²¹ For a recent discussion of this and other pros and cons regarding the use of laboratory experiments in economics, see Falk and Heckman (2009).

p. 523; emphasis in original). Hence, sometimes behavioral regularities found with students are even amplified with nonstudent subjects.

A third way to test external validity is to conduct field experiments. Field experiments might be seen as an extreme combination of the two already described ways of adding ‘realism’ to ‘experiments’. In field experiments researchers try to add the largest possible number of ‘pieces of reality’ and use nonstudent subjects in their “natural” environment. Harrison and List (2004) provide a typology of field experiments and define them, crudely speaking, as experiments where one is “recruiting subjects in the field rather than in the classroom, using field goods rather than induced valuations, and using field context rather than abstract terminology in instructions” (Harrison and List, 2004, pp. 1009–1010).

Without doubt, field experiments are an interesting and important development in economic research, but they also have their disadvantages. For instance, in comparison with the use of induced valuations, the use of field goods contributes to a loss of control regarding participants’ true valuations of commodities, the use of special nonstudent subjects in their special circumstances does not necessarily not allow one to draw conclusions beyond the investigated group in the investigated circumstances, and field experiments usually do not allow for replications as precise as in the laboratory. Therefore, especially in research that is concerned with policy advice, field experiments are best viewed as an important complementary research method.

In the ideal case, an economic policy reform is evaluated with *all possible* scientific methods before a political decision is made: theoretically, experimentally in the lab and the field, and with traditional applied econometrics. It should be obvious that a thorough, scientifically sound examination of a policy reform that reduces the risk of implementing bad policies is much cheaper (at least in expectations) than the costs of an actually implemented bad policy. A rare example of a first – albeit incomplete – attempt at such a scientific approach to policy issues is the evaluation of the so-called Plan Van Elswijk in the Netherlands, which proposes a radical reform of the (Dutch) financing system for unemployment benefits. In the evaluation of this plan, simulation studies, laboratory experiments, and a small field experiment were conducted (see van Winden et al., 1999, 2000; Riedl and Winden van, 2001, 2007, 2008, and the references therein). These studies produced a rather clear picture of the likely benefits and disadvantages of the proposed reform.²² An important lesson learned from these studies is that laboratory experiments can indeed provide valuable information even for such complex questions as unemploy-

²² In the end, despite the clear-cut results, policymakers chose to interpret them differently than most involved researchers, and to a large extent they ignored the scientifically obtained outcomes.

ment benefit reform plans. Thus, one may safely conclude that laboratory experiments, together with field experiments and theoretical reasoning, will play an important role in public policy advice in the future.²³

A further stream of research – quite different, but potentially equally relevant, and in the long run probably even more important though more debated – is the recent combination of neuroscience with experimental and behavioral economics. This new research branch – *neuroeconomics* – uses knowledge about brain mechanisms to study the biological foundations of behavioral regularities observed in the laboratory and the field. Kevin McCabe, one of the pioneers in this new field of the behavioral sciences, defines it as follows:

Neuroeconomics is an interdisciplinary research program with the goal of building a biological model of decision making in economic environments. [More specifically, it] is the study of how the embodied brain interacts with its external environment to produce economic behavior. Research in this field will allow social scientists to better understand individuals' decision making, and consequently to better predict behavior.

McCabe (2003, p. 294)

At first sight this may sound abstract and remote from public policy issues. Indeed, in the above definition, the first part refers to the pure scientific element of neuroeconomics. The second part, however, reflects the potential of this approach for public policy making. Having *good models* of human behavior is crucial for making *good predictions* of human behavior in economic situations. Neuroeconomics has the potential to significantly contribute to this quest for better models of economic decision-making. When evaluating the potential of this new emerging field, one may want to recall the history of game theory and laboratory experiments in economics. In its beginnings, game theory was largely dismissed as being too academic and thought to be useful at most for war strategists, but surely not for the analysis of ordinary economic interactions. Nowadays game theory is used for policy advice on a large scale in many countries. (Recall, e.g., the commercial frequency auctions a few years ago, where game theorists played a crucial role in designing auction formats.) Later, experimental and behavioral economics was smiled at by many economists because it was the received wisdom in economics that “economists...cannot perform...controlled experiments” (Samuelson and Nordhaus, 1985), a view that changed quite a bit over the years, as the following statement by the very same authors seven years later testifies: experimental economics is an “exciting new development”

²³ An interesting recent example where laboratory experiments informed politics is given in Jacob K. et al. (2005). For a survey of experiments for economic policy in the context of industry regulation, see Normann (2004) and Hinloopen and Normann (2009).

(Samuelson and Nordhaus, 1992). It is not unlikely that neuroeconomics awaits the same fate. Bernheim (2009) and Rustichini (2009) are recent critical appraisals of this new development in economics.

In any event, both directions – towards the experimental field and towards the brain – can be expected to be among the most lively areas of research in economics, and both are likely to produce results that will lead to better models, better predictions, better advice, and ultimately also – we may hope – better-informed public policies.

6. Conclusion

In the course of this contribution I have discussed a few areas in experimental and behavioral economics that are of importance for public economics and public policy. Naturally, many at least equally important issues were not even slightly touched upon – for instance, voluntary contributions to public goods (see, e.g., Gächter and Herrmann, 2009); time-inconsistent intertemporal decision-making, e.g., with respect to retirement decisions and pension systems (see, e.g., Frederik et al., 2002); decision-making under risk and uncertainty, e.g., with respect to health insurance and social security in general (see, e.g., Kahneman and Tversky, 1979; Wakker et al., 2007; Heinemann et al., 2008); or the role of moral property rights in policy reform (see, e.g., Gächter and Riedl, 2005) – to name only a few. For the future, also the fundamental issue of *welfare analysis beyond revealed preferences* is awaiting public economics research and, more generally, economic theory. First important steps in this direction have been made by Bernheim and Rangel (2009) and by Herings and Rohde (2006).

In recent years, the facts of behavioral regularities have been shown to be incompatible with the traditional wisdom of economic theory. This has led to the development of new theoretical approaches and models. It seems clear that for good public policy we need both good accounts of the behavioral facts and a theoretical knowledge that gives us the tools to deal with the upcoming challenges in an accurate way. This is all the more important in that politicians are increasingly more willing to listen to the advice of behavioral and experimental economists. In fact, the 2005 quotation that opens this paper has been overtaken by reality: *Time* magazine reports that behavioral economists are advising U.S. President Barack Obama (Grunwald, 2009).

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Arno Riedl
Maastricht University
School of Economics and Business
Department of Economics (AE1)
P.O. Box 616
NL-6200 MD Maastricht
The Netherlands
a.riedl@maastrichtuniversity.nl

